

### **Remarks**

Claims 12 and 14-29 are pending in the application. Of those, claim 12 is the only independent claim. Claim 12 stands rejected under §103(a) as being unpatentable over U.S. Patent No. 5,302,547 to Wojnarowski in view of U.S. Patent Publication No. 2002/0121692 to Lee et al.

For the reasons set forth below, it is respectfully submitted that the rejection of claim 12 should be withdrawn. Reconsideration of the pending application is therefore respectfully requested.

#### **1. Independent claim 12.**

Applicant respectfully contends that claim 12 is patentable over the cited references because the cited references do not teach or suggest applicant's claimed step of removing an upper layer of a multiple-layer device by ablating an adjacent (lower) sacrificial layer without ablating the upper layer. The cited prior art appears to remove the upper layer by ablating that layer directly. The fact that the upper layer of the cited reference may be optically transparent does not mean that it cannot be ablated, since saying that a material is "optically transparent" is not equivalent to saying that the material is non-ablatable.

As background, applicants' claimed invention is a method for manufacturing a test sensor. The method of claim 12 comprises:

- 1) forming a multiple layer device, including depositing a first metallic layer onto a substrate material by physical vapor deposition;
- 2) depositing an intermediate, sacrificial layer on said metallic layer;

3) depositing an electrically non-conductive layer adjacent said intermediate, sacrificial layer by plasma enhanced chemical vapor deposition; and

4) applying to said multiple layer device an amount of energy ineffective to ablate said electrically non-conductive layer directly, but effective to selectively ablate a portion of said intermediate, sacrificial layer, thereby removing said intermediate, sacrificial layer and causing a corresponding portion of said non-conductive layer to be removed.

U.S. Patent No. 5,302,547 to Wojnarowski is the primary reference cited against the application. The Wojnarowski reference is cited as disclosing the laser ablation of a lower, sacrificial layer to remove an upper, non-conductive layer without ablating the upper layer. The portion of Wojnarowski that is cited as disclosing that feature is col. 3, lines 37-48, shown below (emphasis added):

According to another preferred embodiment of the invention, an inorganic optically transparent mask is deposited over an optically absorbing polymer material overlying an optically non-absorbing polymer material to form a structure that is patternable by an adaptive masking technique. Laser ablation patterning of the absorbing polymer material ablates the overlying mask in the same area, providing an integral opening. An opening is etched in the nonabsorbing polymer material, aligned with the opening in the absorbing polymer material, without loss of dielectric thickness.

Initially, applicant notes that the literal language of the Wojnarowski reference says that the laser ablates the overlying mask layer. However, it is believed that the Office contends that Wojnarowski should not be read to mean what the text literally says, and instead should be read to mean that the overlying mask layer is removed indirectly without being ablated. The Office appears to reach this conclusion because Wojnarowski's masking layer is disclosed as being

optically transparent. As applicant understands the Office's reasoning, an optically transparent layer does not absorb laser energy, and therefore cannot be ablated by a laser.

Applicant's attorneys have not yet been able to confirm whether the Office is correct on this question of fact about whether an optically transparent layer may be capable of laser ablation. However, it is noted that there are numerous publications that appear to disclose the laser ablation of silicon nitride films such as are used by Wojnarowski, casting doubt on the Office's conclusion. For example, Baird appears to disclose the laser ablation of silicon nitride at <http://www.photonicsonline.com/article.mvc/Picosecond-Ablation-Of-Silicon-Nitride-Using-0002>; Knorz appears to disclose the laser ablation of silicon nitride at <http://onlinelibrary.wiley.com/doi/10.1002/pip.856/pdf>; Payne appears to disclose the laser ablation of silicon nitride passivation at <http://www.parc.com/content/attachments/investigation-laser-ablation.pdf>; and an uncredited author appears to show the laser ablation of silicon nitride in photovoltaics at <http://www.youtube.com/watch?v=I4d7cnPs2U4>. In view of these publications, applicant respectfully submits that the Office has not made a prima facie case of obviousness as to applicant's claimed step of removing an upper, masking layer by ablating a lower, sacrificial layer without also ablating the upper, masking layer.

To support the Office's conclusion that the claimed invention is obvious, the cited references must expressly or impliedly suggest the claimed invention, or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985). In this case, the cited reference teaches only: 1) laser ablation patterning of the lower polymer material also ablates the overlying mask in the

same area; and 2) the overlying mask layer may be optically transparent. Absent evidence that optically transparent masking layers must also be incapable of laser ablation, the Wojnarowski reference does not appear to expressly or impliedly teach applicant's claimed invention.

The Office's contention that Wojnarowski should be read as teaching that the masking layer is not ablated during the ablation of the dielectric layer below is not supported by any evidence of record. To the extent that the Office relies on that conclusion to support a rejection under §103, evidence that optically transparent materials are not capable of laser ablation should be made of record. This is particularly the case when, as here, applicant believes that Wojnarowski's masking layer may be removed by laser ablation.

In addition to the above, it should be recognized that the sacrificial layer as claimed is deposited directly on a metallic layer, such that when it is ablated (and thus removes the non-conductive layer above it) it exposes the metallic layer in a desired pattern according to the ablation pattern. In contrast, Wojnarowski teaches depositing the sacrificial layer (second dielectric layer 20) on a first dielectric layer 18 which remains intact after the ablation step. Thus, with the structure disclosed by Wojnarowski, the metallic layer is not exposed by the ablation of the sacrificial layer. The Office does not appear to have made any showing as to why it would be obvious to modify Wojnarowski to provide a sacrificial layer directly on the metallic substrate as claimed by applicant's claim 12.

For all the above reasons, applicant respectfully submits that the rejections under §103 should be withdrawn.

2. Dependent Claims 14-29.

Since dependent claims 14-29 all depend from independent claim 12, those claims are patentable for depending from a patentable base claim.

3. Conclusion.

For the reasons stated above, reconsideration of the pending application is respectfully requested.

Respectfully submitted,

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